

The petitioner states that the Cessna Aircraft Company of Wichita, Kansas, is the manufacturer of a comprehensive line of general aviation aircraft. This line includes turboprop-powered airplanes in the 500 series. At present, Cessna manufactures duplicate aircraft in the Citation I type (Models 500 and 501) and also the Citation II (Models 550 and 551) such that their only difference is their type certificate.

Those that have Part 25 as a certification basis require a second in command. Citations certificated under Part 23 do not require a second in command. The petitioner seeks to enable single-pilot operation of Citations certificated under Part 25 based on safe single-pilot operation experience accumulated in their Part 23 counterparts.

Using the standards of Part 23 has provided an interim solution to the needs of operators for a single-pilot airplane. Experience with these models over the past 6 years has confirmed their capability for safe operations with a single pilot. Although accidents in any aircraft are an unfortunate reality, the petitioner states that the Citation series has experienced fewer than other contemporary types, and the Citation single-pilot models have a lower unit accident and incident rate than their Part 25 counterparts.

With the changes now in work to improve the Model 550 and in that process increase the takeoff weight to 14,300 pounds, it is no longer feasible to offer a companion product, a Model 551 derivative, that could incorporate the same improvements as the Citation II Serial 550-0501 configuration and still be limited to the 12,500-pound takeoff weight limitation of Part 23. Similarly, it is not feasible to resolve special purpose, 15,000-pounds takeoff gross weight (TOGW) Model 552 operations objectives by a Part 23 certification.

It is Cessna's position that since all of the 500 series airplanes have very high commonality in their pilot stations and in their operating characteristics, there is no substantive difference in the capabilities of a single type-rated pilot to operate any of the airplanes safely. Equipment installations and standards of design and manufacture are identical, irrespective of certification basis of the category which is eventually selected by the operator. Many operators have utilized available service bulletins to change from one category to another.

Cessna has requested that FAA examine the issue of Part 25 Citations in the 500 series being operated by a single pilot. Of this group of airplanes the Model 500, or Citation I, meets the Section 1.1 definition of "small aircraft" and is eligible under the applicable certification basis. However, other Part 25 airplanes in the Citation II class exceed 12,500 pounds takeoff weight and FAA has determined that a second in command required by the operating rules and the incapacitation criterion would preclude type certification with a single pilot.

Because of Section 91.213(a), the petitioner finds it necessary to seek an exemption so that the issue of single-pilot operation of Part 25 Citations may be examined solely on the basis of technical merit and safety.

Cessna has observed more than 6 years of operators' experience with single-pilot turboprop Citations. Of particular interest is experience with the Model 550/551 Citation II design. The two models are constructed from the same drawing, have a common manufacturing base (assembly line, tools, fixtures, etc.), and are indistinguishable with respect to category until the time of presentation for an airworthiness certificate. As standard equipment, both models are fitted with the systems specified as prerequisites for single-pilot operations.

Having identified a takeoff weight difference as the only physical manifestation of difference between normal and transport category Citation II airplanes, one is brought to the question of whether the weight difference would cause a safety problem with single-pilot operation at the transport category takeoff weight limitation. Cessna maintains, and pilot opinion confirms, that Citation workload differences attributable to weight differences are inconsequential. Cessna concludes that application of regulations to constrain single-pilot operations in transport category Citations dogmatically exceeds the regimen necessary for an acceptable level of safety.

The petitioner states that the situation is similar in many ways to the promulgation of Amendment 25-3. In that case the FAA amended certification criteria such that the flight engineer's crew position is equated to needs of the airplane rather than tying the crew makeup to a weight limit in the operating rules. In both cases the capability of an applicant to type certificate an appropriate minimum crew requires separation from the constraints of the inappropriate weight parameter.

Cessna contends that statistical examinations of accident/incident data show that operations by a single pilot are safe. The record shows an absence of accidents or incidents in high traffic density airspace. In addition to the above, it is Cessna's assertion that the data do not show accidents of any type where the presence of a second in command would have assured accident avoidance.

At this time, Cessna is preparing for type certification of two derivative models of the Citation II. The changes involved in these derivatives will have an almost negligible effect on cockpit workload. Cessna expects them to also be capable of safe operation by pilots holding the same type rating as Citation II's already in service and thereby have the same capability for single-pilot operation. However, normal category certification is now unacceptable because the increases in takeoff weight associated with the improvements incorporated in these derivatives prohibit the practicality of off-loading sufficient useful load to reach the 12,500-pound normal category limit.

Cessna believes that the requested exemption is in the public interest for the following reasons:

- (1) In these times of high unemployment among manufacturers of general aviation aircraft, any factor that can stimulate buyer interest within the aviation community is profoundly in the public interest. Cessna believes that the capability to market a single-pilot Part 25 Citation II is such a factor. Cessna's Chairman, Mr. Russell W. Meyer, Jr., has estimated that each unit of the 500 series that is sold represents the direct employment of 100 aerospace workers. Added to that is the job's impact of associated community support and service employment.
- (2) The capability for single-pilot operation in Part 25 Citations will make them more competitive against foreign-manufactured aircraft, unless or until those aircraft can also be shown to be safe for single-pilot operation. An improved competitive position enhances the position of the United States among world aerospace manufacturers, helps to preserve jobs in United States aerospace manufacturing and benefits the United States by reducing the outflow of dollars as well as reducing negative balance of payment pressures. The President of the United States, through the Office of Science and Technology Policy, has identified United States preeminence in aviation and aerospace as a necessary goal.

- (3) Operators advise Cessna that substantial economic benefits result from the capability for single-pilot operation. Although Citations are often operated with a second in command, whether or not single-pilot operation is authorized, the flexibility afforded by this authorization can materially reduce day-to-day operating costs. Additional economies will accrue by relief through transport category certification of the 12,500-pounds normal category weight limit since the added fuel capability can allow a trip to be made without fuel-wasting intermediate stops. Also, the availability of the option of operating single pilot often adds a dimension of scheduling flexibility that can eliminate the need of some flights. Thus, the economy of single-pilot operation is in the public interest both from the standpoint of conserving financial resources and from the standpoint of conserving fuel resources.

The petition was published verbatim in the Federal Register on October 12, 1983 (48 FR 46358). Thirty-nine comments were received, the majority of which disapprove of Cessna's proposal. Most express concern about the safety of single-pilot operations at high altitudes and in high-density terminal areas. Some believe that the single pilot would have difficulty coping with various emergencies including passenger problems in adverse weather conditions.

Two commenters recommend that single-pilot authorization for Citations certificated under Part 23 be rescinded and another recommends that turbo-propeller-powered aircraft be required to have two pilots.

Some commenters question the validity of Cessna's assertion that the airplane has been operated safely in single-pilot operations and question the statistics used to make the determination. All of the commenters who favor Cessna's petition, except one, are operators of the airplane. All of the CE-500 operators, except one, state that they normally require a second in command for most of their operations.

Many commenters express the view that 12,500 pounds is an obsolete barrier and has little to do with the safe operation of the aircraft. Additionally, most operators of the CE-500 contend there is no practical difference between the Part 23 and the Part 25 airplanes.

The Federal Aviation Administration's (FAA) analysis/summary is as follows:

The FAA has determined that Cessna's situation is unique in that its initial design concept of the CE-500 envisioned operation with a single pilot. Although initial certification under Part 25 required operation with two pilots, the aircraft was subsequently certificated under Part 23 criteria for single pilot operation, and has 6 years of operating experience under Part 23. To date, this is the only turbojet aircraft that has evolved in this manner and in this regard, Cessna is correct in its contention that both the Part 23 and the Part 25 aircraft are identical from an operational standpoint.

Many commenters express concern as to the safety of single-pilot operations. However, there are no data that specifically show a derogation of safety from two-pilot operations. Information, as supplied by the petitioner, indicates that single-pilot operations in the Part 23-certificated CE-500 constitute 22 percent of the eligible single-pilot flights and flight hours. Single-pilot CE-500 operations involve a wide variety of airports worldwide. Further, these comments apparently are directed to proposed operations which might be conducted without conditions or limitations beyond those currently required by the FAR. The FAA has determined that, in view of the past operating experience of Citation airplanes certificated under Part 23, an exemption with appropriate conditions and limitations attached would not have an adverse effect on safety in operations using the Citation airplanes certificated under Part 25. To ensure these operations will not adversely affect safety, pilots operating under this exemption must meet certain experience, training, and testing requirements that exceed those required of a pilot in command of an aircraft using two pilots.

In addition to the reasons stated by the petitioner, a grant of exemption would serve the public interest by providing operators with increased operating flexibility and reduced economic burdens. It also would provide the FAA with data that could be used to help assess the need for general rulemaking.

An additional consideration for a grant of exemption concerns certain provisions of Section 91.31, which prohibit the operation of a civil aircraft without compliance with the operating limitations prescribed by the certificating authority of the the country of registry. One of the limitations for U.S.-registered aircraft is the requirement that the aircraft be operated in accordance with the

operating limitations prescribed by the Administrator and contained in the current, approved Airplane Flight Manual. One operating limitation specifies the minimum required flightcrew, which, for the CE-500 certificated under Part 25, consists of two flight crewmembers. The FAA has determined that, to allow implementation of the requested relief, an exemption from Section 91.31 is appropriate to the extent necessary to allow single-pilot operation of the affected aircraft.

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in Sections 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the operators of Cessna aircraft Models 550 and 552, are granted an exemption from Sections 91.213 and 91.31 of the Federal Aviation Regulations to the extent necessary to allow their operation by one pilot without a second in command, subject to the following conditions and limitations:

1. Each pilot used in single-pilot operations shall
 - a. hold a current Class II airman medical certificate;
 - b. hold a commercial pilot certificate with instrument, category, class, and type rating, as appropriate;
 - c. have logged 1,000 hours total pilot flight time, including at least 50 hours flight time at night, 75 hours instrument flight time, 40 hours of instrument flight time in actual instrument meteorological conditions, and 500 hours as pilot of turbojet airplanes; and
 - d. hold a certificate showing completion of high altitude/physiological training.
2. Each pilot shall complete an annual recurrent training program recommended by the manufacturer and approved by the Administrator consisting of ground, flight, and simulator instruction designed to prepare the pilot for the Section 61.58 check as a single-pilot operation. Training shall also include high-altitude aerodynamics and special flight characteristics. The maneuvers described in Appendix A of Part 61 may be accomplished either in a simulator or in flight. Training must consist of at least one flight operating as a single pilot along a normal route profile. Planned speeds and altitudes will be at least 80 percent of certificated aircraft limitations.
3. Operation with a single pilot is contingent upon a fully functioning autopilot controllable about three axes and capable of approach coupling. In the absence of a fully functioning autopilot, a minimum crew of two pilots is required.

4. Each pilot used in single-pilot operations shall satisfactorily accomplish a proficiency check as described in Section 61.58 in the make and model aircraft. The proficiency check shall be conducted by an FAA inspector or an authorized pilot proficiency examiner (PPE) and will include each maneuver in Appendix A to the standards of Section 61.157(a). The pilot shall have an annual endorsement by the FAA inspector or Pilot Proficiency Examiner for the make and model aircraft showing competency in single-pilot operations and satisfactory use of an autopilot.
5. The pilot shall use a boom microphone.
6. For the first 100 hours of flight operation by each pilot in CE-500 airplanes as a single pilot, the instrument approach minimums will not be less than 200 feet and 1 mile above published minimums. Circling approaches are not authorized.
7. Cessna shall provide each person authorized to operate under the provisions of this exemption with a copy of this exemption and shall provide the Director of Flight Operations with the name and address of each such operator.
8. Each operator shall carry a copy of this exemption on board each aircraft when operating under the provisions of the exemption.
9. No operator may transfer the provisions of this exemption when operational control is relinquished.
10. Eighteen months from the date of issuance of this exemption, Cessna aircraft will provide the Director of Flight Operations with an analysis of operations conducted under this exemption with respect to operational exposure, accident/incident data, and any known problem areas.

This exemption terminates July 31, 1986, unless sooner superseded or rescinded.

/s/ Kenneth S. Hunt
Director of
Flight Operations

Issued in Washington, D.C., on
June 27, 1984.